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CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL
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CLAIMS

[Claim(s)]

[Claim 1] The washing method of the demarcation membrane module which is the method of washing the demarcation membrane module which was immersed in the processed liquid tub, attracted the demarcation membrane module from the filtrate side, filtered the processed liquid, and was blockaded by this filtration, and is characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of a demarcation membrane module after discharging the processed liquid in a processed liquid tub.

[Claim 2] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid two or more times intermittently in the washing method of a demarcation membrane module according to claim 1.

[Claim 3] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of a demarcation membrane module, and holding in the washing method of a demarcation membrane module according to claim 1 where a medical fluid is filled in this demarcation membrane module.

[Claim 4] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module in the washing method of a demarcation membrane module according to claim 1 to 3 after discharging the processed liquid in a processed liquid tub and pressure water washes from the film outside surface of a demarcation membrane module.

[Claim 5] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by discharging the processed liquid in a processed liquid tub, and dipping a medical fluid from the filtrate side of this demarcation membrane module again in the washing method of a demarcation membrane module according to claim 1 to 4 after dipping a medical fluid from the filtrate side of a demarcation membrane module.

[Claim 6] In the washing method of a demarcation membrane module according to claim 1 to 4, divide the processed liquid in a processed liquid tub into multiple times, discharge it, and for this one occurs end of every by the method of dipping a medical fluid from the filtrate side of a demarcation membrane module. The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module again after discharging the whole of this processed liquid.

[Claim 7] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module again in the washing method of a demarcation membrane module according to claim 1 to 4 by the method of dividing into multiple times and discharging the processed liquid in a processed liquid tub while dipping a medical fluid continuously from the filtrate side of a demarcation membrane module after discharging the whole of this processed liquid.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention is immersed in a processed liquid tub, attracts a demarcation membrane module from a filtrate side, filters a processed liquid, and relates to the method of washing the demarcation membrane module blockaded by this filtration.

[0002]

[Description of the Prior Art] Conventionally, the demarcation membrane module has been used for manufacturing installations, such as sterile water, potable water, and a high purity water, and the purge of air. In addition to these uses, in recent years, using this demarcation membrane module for processing of the high liquid of corruption nature is examined, and the part is put in practical use. Specifically with processing of the high liquid of corruption nature, the secondary treatment and tertiary treatment in sewage treatment, the solid liquid separation in the septic tank, etc. are raised.

[0003] Drawing 2 is the schematic diagram showing an example of a filter which used the demarcation membrane module. Outline composition of the filter of this example is carried out with the processed liquid tub 2, the demarcation membrane module 4 arranged in this processed liquid tub 2, and the pump 6 connected with this demarcation membrane module 4 by the piping 8 for filtrates. By working this pump 6, the processed liquid filled by the processed liquid tub 2 by the inside of the demarcation membrane module 4 becoming negative pressure is filtered by the demarcation membrane module 4, and the filtrate passes along the piping 8 interior for filtrates, and is discharged out of a system.

[0004] The fall of the separability by lock out of the demarcation membrane module 4 which happens by above-mentioned filtration operation can be known by elevation of the differential pressure at the time of the filtration which can be measured with the pressure gage 10 formed in the piping 8 for filtrates, and the fall of a filtration flow rate. Especially, in processing of the high liquid of such corruption nature, lock out of the demarcation membrane module 4 tends to take place, and, for this reason, short period-ization of the life of the demarcation membrane module 4 poses a problem. Then, by moving to the tank for washing which filled the medical fluid, flooding with a fixed time medical fluid and washing the demarcation membrane module 4 blockaded as mentioned above, the lock out causative agent adhering to the demarcation membrane module 4 is removed, and recovering the separability is performed.

[0005]

[Problem(s) to be Solved by the Invention] However, in the washing method by the medical fluid of the above-mentioned demarcation membrane module 4, you have to move the demarcation membrane module 4 to the tank for washing. Moreover, although performing medical fluid washing of this demarcation membrane module 4 is also considered without moving the demarcation membrane module 4 by discharging the processed liquid in the processed liquid tub 2, changing to this, and filling a medical fluid, to the size of the demarcation membrane module 4, since the capacity of this processed liquid tub 2 is quite big, it needs a lot of medical fluids, and is not practical.

[0006] this invention was made in view of the aforementioned situation, is immersed in a processed liquid tub, attracts a demarcation membrane module from the filtrate side, filters a processed liquid, and does not need movement of a demarcation membrane module in the method of washing the demarcation membrane module blockaded by this filtration, but it is a small amount of medical fluid, and it is efficient and aims at offering the washing method of the demarcation membrane module which washes a demarcation membrane module.

[0007]

[Means for Solving the Problem] The washing method of the demarcation membrane module of this invention is immersed in a processed liquid tub, and attracts a demarcation membrane module from a filtrate side. It was the method of washing the demarcation membrane module which filtered the processed liquid and was blockaded by this filtration, and after discharging the processed liquid in a processed liquid tub, it made to wash a demarcation membrane module into the solution means of the aforementioned technical problem by dipping a medical fluid from the filtrate side of this demarcation membrane module. Moreover, an above-mentioned medical fluid can also be dipped two or more times intermittently. Moreover, in the washing method of an above-mentioned demarcation membrane module, a high cleaning effect can be obtained in the fewer amount of medical fluids by dipping a medical fluid from the filtrate side of a demarcation membrane module, and carrying out fixed time maintenance, where a medical fluid is filled in a demarcation membrane module.

[0008] Moreover, in the washing method of an above-mentioned demarcation membrane module, after discharging the processed

liquid in a processed liquid tub and pressure water washes the film outside surface of a demarcation membrane module, a medical fluid can also be dipped from the filtrate side of this demarcation membrane module. Moreover, in the washing method of an above-mentioned demarcation membrane module, after dipping a medical fluid from the filtrate side of a demarcation membrane module, this demarcation membrane module can also be washed by discharging the processed liquid in a processed liquid tub, and dipping a medical fluid from the filtrate side of a demarcation membrane module again.

[0009] Moreover, in the washing method of an above-mentioned demarcation membrane module, in case the processed liquid in a processed liquid tub is discharged, this processed liquid can be divided into multiple times, and can be discharged, and all these processed liquids can also be discharged for this one occasion end of every by the method of dipping a medical fluid from the filtrate side of a demarcation membrane module. Or all these processed liquids can also be discharged by the method of dividing the processed liquid in a processed liquid tub into multiple times, and discharging it, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module. Thus, after discharging the processed liquid in a processed liquid tub, this demarcation membrane module can also be washed by dipping a medical fluid from the filtrate side of a demarcation membrane module again.

[0010]

[Embodiments of the Invention] Drawing 1 shows the example of a suitable filter to enforce the washing method of the demarcation membrane module of this invention. Outline composition of the filter of this example is carried out by the pump 6 connected with the processed liquid tub 2, the demarcation membrane module 4 arranged in this processed liquid tub 2, and this demarcation membrane module 4, and the medical fluid tub 14. The three-way-type change-over valve 12 is formed in the connection of the piping 7 which connects the demarcation membrane module 4, a pump 6, and the medical fluid tub 14, the piping 8 for filtrates, and the piping 16 for medical fluids. By switching this three-way-type change-over valve 12, a switch with the state where piping 7 was connected to the piping 8 for filtrates, and the state where piping 7 was connected to the piping 16 for medical fluids can be performed. Moreover, the opening-and-closing valve 18 is formed in the piping 16 for medical fluids.

[0011] In case it filters, as a state where the three-way-type change-over valve 12 was connected to the piping 8 for filtrates in piping 7, by working a pump 6, the inside of the demarcation membrane module 4 becomes negative pressure, the processed liquid filled by the processed liquid tub 2 is filtered by the demarcation membrane module 4, and the filtrate passes along the piping 8 interior for filtrates from piping 7, and is discharged out of a system.

[0012] The demarcation membrane module 4 blockaded by the above filtration operations is washed as follows. First, based on drawing 1, the example of the washing method of a demarcation membrane module according to claim 1 is explained below. That is, after stopping filtration operation, all the processed liquids filled in the processed liquid tub 2 are discharged. Next, where the opening-and-closing valve 18 is closed, a medical fluid is filled to the medical fluid tub 14. Then, the three-way-type change-over valve 12 is switched in the medical fluid tub 14 direction, and is made into the state where piping 7 and the piping 16 for medical fluids were connected, the opening-and-closing valve 18 is opened, and a medical fluid is dipped. At this time, a medical fluid passes along piping 7 from the piping 16 for medical fluids, oozes out from the inside of the demarcation membrane module 4 to the film outside surface of the demarcation membrane module 4, and is discharged in the processed liquid tub 2. The flow rate of the medical fluid to dip can also be set up by adjusting the open rate of this opening-and-closing valve 18. Moreover, the medical fluid in the medical fluid tub 14 can also be added during the dipping.

[0013] It is necessary to remove the medical fluid adhering to the demarcation membrane module 4 by methods, such as rinsing and dryness, after dipping of this medical fluid. Although this removal method can take arbitrary methods according to the kind of medical fluid etc., it can change to a medical fluid, can fill water to the medical fluid tub 14, and can also perform this water to it by dipping like dipping of an above-mentioned medical fluid, for example.

[0014] The dipping method of an above-mentioned medical fluid can use a well-known method besides the gravity flow by the above water head differences. For example, the method of sending this medical fluid into the demarcation membrane module 4 with a pump, the method of sending this medical fluid into the demarcation membrane module 4 with the pressure it being stationed in a pressurization container in a medical fluid, and according to a compressor etc., etc. can be used from the medical fluid tub which filled the medical fluid. Moreover, the amount of the minimum dipping of the medical fluid at this time should just be sufficient amount to ooze out to the whole film outside surface of the demarcation membrane module 4. Since it is necessary to dip a medical fluid in fact until this demarcation membrane module 4 can fully wash, the amount of dipping of this medical fluid is a range more than this amount of the minimum dipping, and is arbitrarily set up by a lock out state, its film surface product, etc. of the demarcation membrane module 4. Usually, it is carried out in many cases by 2 to 5 times this amount of the minimum dipping.

[0015] Moreover, arbitrary things can be used for the medical fluid used for washing, and its concentration according to the quality of the material of the demarcation membrane module 4 to wash, the purpose of the filtration, a lock out state, etc. Generally a sodium hypochlorite, a sodium hydroxide, a hydrochloric acid, a sulfuric acid, oxalic acid, a citric acid, the solution of a surfactant, alcohol, etc. can be used.

[0016] Thus, since it is the method of dipping a medical fluid from the filtrate side of the demarcation membrane module 4 after discharging the processed liquid in the processed liquid tub 2, it is not necessary to move the demarcation membrane module 4 out of the processed liquid tub 2 and, and a small amount of medical fluid can wash. Moreover, beforehand, in order to discharge the processed liquid in the processed liquid tub 2, the medical fluid which oozed out from the filtrate side of the demarcation membrane module 4 to the film outside surface is not diluted by the processed liquid by dipping a medical fluid. For this reason, sufficient cleaning effect can be pulled out, without reducing the washing capacity of a medical fluid.

[0017] Moreover, in case a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, a pressure is

applied from the filtrate side of the demarcation membrane module 4, and the force which pulls apart the lock out causative agent which stuck to the film outside surface from a film outside surface works. For this reason, in a cleaning effect, it is more advantageous. The force which pulls apart the lock out causative agent which stuck to the film outside surface of the demarcation membrane module 4 from this film outside surface becomes large, so that this pressure is larger than the filtrate side of the above-mentioned demarcation membrane module 4. However, if this pressure is too large, since the demarcation membrane module 4 may be torn or the intensity may fall, it usually considers as 1-4m water head. This pressure can be adjusted with the flow rate of medical fluid etc. An above-mentioned pressure changes with the configuration of the demarcation membrane module 4, a fractionation performance, and its lock out states. In case what has a small fractionation performance, and what has severe lock out dip a medical fluid, a bigger pressure than the filtrate side of the demarcation membrane module 4 has this inclination.

[0018] In the example of the washing method of an above-mentioned demarcation membrane module, the thing of arbitrary configurations, such as a flat film type [which does not limit and consists of the arbitrary quality of the materials, such as a cellulose, a polyolefine, a polysulfone, a polyvinylidene fluoride, polytetrafluoroethylene, and a ceramic], hollow fiber type, tubular type, an saccate type, can be used especially for the configuration and the quality of the material of the demarcation membrane module 4 which can be washed. Moreover, although the fractionation performance of this demarcation membrane module 4 can choose arbitrary things for the purpose of the filtration, within the limits of an above-mentioned pressure, it is desirable that a medical fluid can be dipped from the filtrate side of the demarcation membrane module 4, and a 0.01-1-micrometer thing can usually be used for it.

[0019] With configurations of this demarcation membrane module 4, how depending on which the medical fluid from the film outside surface oozes, the pressure which can be put from the filtrate side change in the case of washing. For example, since a medical fluid oozes from the whole film outside surface to homogeneity when the flat film type demarcation membrane module 4 is used, washing unevenness cannot happen easily. However, the pressure which can be put from the filtrate side of the demarcation membrane module 4 becomes small as compared with the case where a hollow fiber type is used. Moreover, when a hollow fiber type is used for the demarcation membrane module 4, since the pressure which can be put from the filtrate side of the demarcation membrane module 4 can be enlarged as compared with a flat film type, it can heighten this cleaning effect more. However, since some pressure distribution exist in the longitudinal direction of this hollow fiber, there is an inclination for washing unevenness to tend [a little] to happen. In consideration of the difference of the cleaning effect by the configuration of such a demarcation membrane module 4, it is necessary to set up conditions, such as a kind of medical fluid, concentration and its flow rate, and the amount of dipping.

[0020] Moreover, the washing method of a demarcation membrane module according to claim 2 is the method of dipping a medical fluid two or more times intermittently in the example of the washing method of an above-mentioned demarcation membrane module according to claim 1. It is in the state where piping 7 and the piping 16 for medical fluids were connected, the operation opens the opening-and-closing valve 18, and when it dips some medical fluids filled by the medical fluid tub 14, it closes the opening-and-closing valve 18. Then, the opening-and-closing valve 18 is opened again, and it is carried out by repeating dipping some medical fluids again filled by the medical fluid tub 14 two or more times.

[0021] In this case, the amount of the medical fluid dipped in the 1st time can be arbitrarily set up by the film surface product of the demarcation membrane module 4 etc. that what is necessary is just more mostly than the amount of the minimum dipping, i.e., sufficient amount to ooze out to the whole film outside surface of the demarcation membrane module 4. Although 2nd henceforth better than this amount of the minimum dipping at least, it is usually set up in the 2 to 5 times as much range as this amount of the minimum dipping. Moreover, although the number of times which dips a medical fluid can be set up arbitrarily, it is usually made into 3 - 6 times. It is necessary to set up these conditions suitably according to the lock out state etc. so that washing of the demarcation membrane module 4 may fully be performed. Since according to this method the extraction efficiency of a medical fluid to the lock out causative agent of the demarcation membrane module 4 goes up rather than it dips a medical fluid continuously, it is desirable. Moreover, in case a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, since the force which pulls apart the lock out causative agent by this pressure which stuck to the film outside surface from the film outside surface from the filtrate side of the demarcation membrane module 4 is added over multiple times, it is more effective.

[0022] Moreover, in the washing method of a demarcation membrane module according to claim 1, since the washing method of demarcation membrane module according to claim 3 is a method which heightened the cleaning effect further by dipping a medical fluid from the filtrate side of the demarcation membrane module 4, being in the state where the medical fluid was filled in the demarcation membrane module 4, and carrying out fixed time maintenance, it is the fewer amount of medical fluids, and can wash this demarcation membrane module 4.

[0023] That is, in the example of the washing method of an above-mentioned demarcation membrane module according to claim 1, the medical fluid filled by the medical fluid tub 14 is dipped until a medical fluid oozes to the whole film outside surface of the demarcation membrane module 4. It can hold, where a medical fluid is filled with the state where the medical fluid remains in the medical fluid tub 14 or the piping 16 for medical fluids which connects the opening-and-closing valve 18 with the medical fluid tub 14 at this time, in the demarcation membrane module 4, when this opening-and-closing valve 18 was closed. This holding time can be arbitrarily set up, if it is 5 minutes - 48 hours. If there is no difference with the case where a medical fluid is continuously dipped, as it is less than 5 minutes and 48 hours is exceeded, the medical fluid which oozed out to the film outside surface of the demarcation membrane module 4 may dry, and it is not desirable. After this holding time, the opening-and-closing valve 18 is opened again, and a medical fluid is discharged out of the demarcation membrane module 4. Then, the medical fluid adhering to the demarcation membrane module 4 is removed.

[0024] Moreover, the washing method of this demarcation membrane module according to claim 3 is also applicable to the washing method of a demarcation membrane module according to claim 2. That is, in the example of the washing method of an above-mentioned demarcation membrane module according to claim 2, when some medical fluids filled by the medical fluid tub 1 are dipped, the opening-and-closing valve 18 is closed, and where a medical fluid is filled in the demarcation membrane module 4, it holds. It is also repeatable to open the opening-and-closing valve 18, and to hold again, next, where it closed this opening-and-closing valve 18 and a medical fluid is filled in the demarcation membrane module 4, when some medical fluids filled by the medical fluid tub 14 are made to dip. After the holding time of the last medical fluid is completed, like the case where it is a ****, a medical fluid is discharged from the demarcation membrane module 4, and the medical fluid adhering to this demarcation membrane module 4 is removed.

[0025] At this time, like an above-mentioned case, if the holding time of the medical fluid performed two or more times is 5 minutes - 48 hours, it can be set as arbitration, respectively. Dipping and the number of times of maintenance of this medical fluid are usually carried out all the time 3 to 6 times, although it can set up suitably so that the dirt of this demarcation membrane module 4 can fully wash.

[0026] In the example of the washing method of an above-mentioned demarcation membrane module according to claim 1 to 3, the washing method of a demarcation membrane module according to claim 4 is an effective method, when especially lock out of the demarcation membrane module 4 is remarkable. That is, after discharging the processed liquid in the processed liquid tub 2, and the pressure water of 200-1000kPa washes from the film outside surface of the demarcation membrane module 4, a medical fluid is dipped from the filtrate side of this demarcation membrane module 4. The flow rate and washing time of this pressure water can be arbitrarily set up according to a film surface product, its lock out state, etc. of the demarcation membrane module 4. Thus although it can wash of course with a small amount of medical fluid by washing the film outside surface of the demarcation membrane module 4 with pressure water beforehand before dipping a medical fluid, since a medical fluid can be made to spread uniformly in the whole film surface of the demarcation membrane module 4, the effect that washing unevenness stops being able to happen easily is also acquired.

[0027] In the example of the washing method of an above-mentioned demarcation membrane module according to claim 1 to 4, the washing method of a demarcation membrane module according to claim 5 is the method of discharging the processed liquid in the processed liquid tub 2, and dipping a medical fluid from the filtrate side of the demarcation membrane module 4 again, after dipping a medical fluid from the filtrate side of this demarcation membrane module 4.

[0028] At this time, dipping of a medical fluid performed before discharging the processed liquid in the processed liquid tub 2 can be performed like an above-mentioned case. There should be just more these amounts of dipping than the amount of the minimum dipping, i.e., sufficient amount for this medical fluid to ooze to the whole film outside surface of the demarcation membrane module 4. Usually, it is set up by 2 to 5 times this amount of the minimum dipping. Moreover, usually, if the flow rate at this time is a grade which does not affect the intensity of the demarcation membrane module 4, although it can be set up arbitrarily, it is adjusted from the filtrate side of this demarcation membrane module 4 so that this pressure may be 1-4m water head.

[0029] Thus, beforehand, where a processed liquid is filled in the processed liquid tub 2, by dipping a medical fluid from the filtrate side of the demarcation membrane module 4, a pressure will be applied to the filtrate side of the demarcation membrane module 4, and a medical fluid will permeate. For this reason, in washing performed after discharging the processed liquid in the processed liquid tub 2, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 comes to ooze from the whole filtrate side of the demarcation membrane module 4 to homogeneity.

[0030] This method is a method effective when the lock out state of the demarcation membrane module 4 has a difference by the portion, and when being especially arranged so that the demarcation membrane side of the demarcation membrane module 4 may meet in the depth-sounding direction, it is the washing method that the effect is large. That is, the solid-state which is the lock out causative agent of the demarcation membrane module 4 contained in the processed liquid in the processed liquid tub 2 tends to exist into the lower part portion in the processed liquid tub 2 mostly. For this reason, surely, this solid-state tends to adhere more mostly, namely, it becomes easy to blockade, when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, so that it is the lower part portion of this demarcation membrane module 4.

[0031] Thus, this pressure becomes relatively and large from the filtrate side of the demarcation membrane module 4, so that it is the lower part portion of the demarcation membrane module 4 by the water head difference of this medical fluid to dip, when a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, where a processed liquid is filled in the processed liquid tub 2 as mentioned above, when being arranged so that the demarcation membrane side of the demarcation membrane module 4 may meet in the depth-sounding direction. That is, the pressure from the filtrate side of the demarcation membrane module 4 with a bigger lower part portion with more remarkable lock out becomes this thing. For this reason, in washing performed after discharging a processed liquid, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 comes to ooze from the whole filtrate side of the demarcation membrane module 4 to homogeneity. Therefore, the cleaning effect of the demarcation membrane module 4 can be heightened further, and washing unevenness cannot happen easily, either.

[0032] The washing method of a claim 6 and a demarcation membrane module according to claim 7 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. The washing method of these demarcation membrane modules is a method for making the effect of the washing method of an above-mentioned demarcation membrane module according to claim 5 more certain still higher.

[0033] The discharge method of the processed liquid in the processed liquid tub 2 in the washing method of a demarcation membrane module according to claim 6 is explained below. That is, in the example of the washing method of a demarcation membrane module according to claim 4, a part of processed liquid filled by the processed liquid tub 2 is discharged. Next, a medical fluid is dipped from the filtrate side of the demarcation membrane module 4. Discharge of this processed liquid and dipping of a medical fluid are repeated two or more times, and all processed liquids are discharged.

[0034] The dipping method of the medical fluid at this time and its flow rate are the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 5. There should be just more amounts of dipping of the medical fluid of these multiple times than sufficient amount for this medical fluid to ooze from the film outside surface of the portion immersed in the processed liquid among the demarcation membrane modules 4, respectively. Although the number of times which discharges a processed liquid can be arbitrarily set up with the size of the demarcation membrane module 4 etc., it is usually made into 3 - 6 times.

[0035] When the demarcation membrane module 4 is immersed in the processed liquid, the water pressure of this processed liquid is poured to the film outside surface of the immersed portion. Therefore, if a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, the pressure from the filtrate side of this demarcation membrane module 4 with the bigger portion immersed in the processed liquid will become this thing from the portion which has not been immersed in a processed liquid among this demarcation membrane module 4. A big pressure becomes this thing from the filtrate side relatively, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, since this processed liquid is discharged gradually.

[0036] That is, the bigger pressure of this number of times increases from the filtrate side of this demarcation membrane module 4 so that it is the portion which it tends to blockade when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction. Therefore, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 can be made to ooze out from the whole film surface of the demarcation membrane module 4 to homogeneity more regardless of the difference of the lock out state at the time of the filtration operation in washing performed after discharging the processed liquid in this processed liquid tub 2. For this reason, in above-mentioned washing, washing unevenness cannot happen easily and the cleaning effect can be heightened further.

[0037] Moreover, in the washing method of a demarcation membrane module according to claim 7, a different place from the washing method of a demarcation membrane module according to claim 6 is a point which divides the processed liquid in a processed liquid tub into multiple times, discharges it, and discharges all these processed liquids, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module.

[0038] That is, in the example of the washing method of a demarcation membrane module according to claim 1 to 4, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module, the processed liquid filled by the processed liquid tub 2 is divided into multiple times, it discharges gradually, and all these processed liquids are discharged. The amount of dipping of the medical fluid at this time should just be an amount which can be dipped continuously, while having discharged the processed liquid. Moreover, the flow rate at this time is the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 5. Although the number of times which discharges a processed liquid can be arbitrarily set up with the amount of processed liquids, the size of the demarcation membrane module 4, etc., it is usually made into 3 - 6 times.

[0039] In this case, since a medical fluid is dipped continuously, a pressure becomes this thing from the filtrate side of the demarcation membrane module 4 continuously. Moreover, a pressure with the bigger portion immersed in the processed liquid among this demarcation membrane module 4 than the portion which has not been immersed in a processed liquid becomes this thing from the filtrate side. Long time and a bigger pressure become this thing, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, since this processed liquid is discharged gradually.

[0040] By the way, there is an inclination which is easy to blockade, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side, when the demarcation membrane side of the demarcation membrane module 4 is arranged as mentioned above so that it may meet in the depth-sounding direction. That is, this time becomes [an above more big pressure] long, so that it is the portion which is easy to blockade. Therefore, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 can be made to ooze out from the whole film surface of the demarcation membrane module 4 to homogeneity regardless of the difference of the lock out state at the time of the filtration operation in washing performed after discharging the processed liquid in this processed liquid tub 2. For this reason, washing unevenness cannot happen easily and the cleaning effect can be heightened further.

[0041]

[Example] Hereafter, an example is shown and this invention is explained in detail.

(Example 1) The washing examination of a demarcation membrane module was performed using the filter of structure as shown in drawing 1. The demarcation membrane module 4 arranges in parallel five Mitsubishi Rayon Co., Ltd. make "the STELLA pore L" (the fractionation performance of 0.1 micrometers, hollow fiber use), and installs it (since this film surface product of one sheet is 2.2m, the film surface product at the time of using these five sheets is 2.10m). The diaphragm pump (tradename) was used for the pump 6.

[0042] As a processed liquid, the water which made 200 ppm yeast suspend was used. Filtration operation of an above-

mentioned filter was performed by filtration flow rate 660 ml/min. Consequently, the differential pressure at the time of the filtration at the time of an experiment start is 23cmHg(s), and the differential pressure after 2 hours operation was set to 60cmHg(s).

[0043] Thus, washing by the medical fluid was performed about the blocked demarcation membrane module 4. That is, all the processed liquids filled in the processed liquid tub 2 were discharged first. The sodium-hydroxide solution was dipped 1 5l.%, next, as a medical fluid, just before the whole of this medical fluid flows and fell, the opening-and-closing valve 18 was closed, and it considered as the state where the medical fluid was filled in the demarcation membrane module 4. At this time, the water head difference at the time of dipping this medical fluid was 3m, and the flow rate of this medical fluid was 400 ml/min. As it is, after holding for 3 hours, the medical fluid in the demarcation membrane module 4 was discharged, and this demarcation membrane module 4 was fully rinsed.

[0044] Thus, about the washed demarcation membrane module 4, again, using the water which made 200 ppm yeast suspend as processed liquid, the filtration flow rate was fixed 660 ml/min, and performed filtration operation. Consequently, the differential pressure at the time of early filtration was 22cmHg(s).

[0045] (Example 2) In an example 2, a different place from an example 1 is a point which dips a medical fluid two or more times intermittently. That is, the demarcation membrane module 4 blocked like the example 1 was washed as follows. First, all the processed liquids filled in the processed liquid tub 2 were discharged. Next, the sodium-hydroxide solution was dipped as a medical fluid 1 5l.%, just before the whole of this medical fluid flows and fell, the opening-and-closing valve 18 was closed, and it considered as the state where the medical fluid was filled in the demarcation membrane module 4, and this state was held for 3 hours. Next, the sodium-hydroxide solution was dipped like the above-mentioned case 1 3 morel.%, it considered as the state where the medical fluid was filled in the demarcation membrane module 4, and this state was held for 2 hours. Like the 2nd time, after repeating dipping and its maintenance of a medical fluid twice, the medical fluid in the demarcation membrane module 4 was discharged, and this demarcation membrane module 4 was fully rinsed. 1% sodium-hydroxide solution used at this time was 14l. in all.

[0046] Thus, as a processed liquid, using the water which made 200 ppm yeast suspend, the filtration flow rate was fixed 660 ml/min, and performed filtration operation again about the washed demarcation membrane module 4. Consequently, the differential pressure at the time of early filtration was 22cmHg(s).

[0047] (Example of comparison) About the demarcation membrane module 4 blocked like the example 1, it washed as follows. Namely, this demarcation membrane module 4 was removed from the inside of the processed liquid tub 2, and it flooded with the tank for washing which filled the sodium-hydroxide solution 1 100l.% for 3 hours. Then, the demarcation membrane module 4 was fully rinsed.

[0048] Thus, the washed demarcation membrane module 4 was again installed in the processed liquid tub 2, and filtration operation was performed by filtration flow rate 660 ml/min using the water which made 200 ppm yeast suspend as a processed liquid. Consequently, the differential pressure at the time of early filtration was 23cmHg(s).

[0049] Thus, in the example 1 and example 2 concerning the washing method of the demarcation membrane module of this invention, it is in Ming that a cleaning effect without the example of comparison which it is not necessary to move the demarcation membrane module 4 and, is a small amount of medical fluid, and is the washing method of the conventional demarcation membrane module, and inferiority is obtained.

[0050]

[Effect of the Invention] As explained above, the washing method of the demarcation membrane module of this invention according to claim 1 It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. Since it is the method of washing the demarcation membrane module blocked by this filtration, and is the method of dipping a medical fluid from the filtrate side of a demarcation membrane module after discharging the processed liquid in the processed liquid tub, it is possible for it not to be necessary to move a demarcation membrane module, and to wash with a small amount of medical fluid.

[0051] Moreover, since the washing method of a demarcation membrane module according to claim 2 is the method of dipping a above-mentioned medical fluid two or more times intermittently, it can heighten the cleaning effect further. Moreover, in the washing method of a claim 1 and a demarcation membrane module according to claim 2, since it is in the state where dipped the medical fluid and the medical fluid was filled in this demarcation membrane module from the filtrate side of a demarcation membrane module and is the method of carrying out fixed time maintenance, the washing method of a demarcation membrane module according to claim 3 is the more nearly little amount of medical fluids, and can be washed.

[0052] Moreover, in the washing method of a demarcation membrane module according to claim 1 to 3, after it discharges the processed liquid in a processed liquid tub, since the washing method of a demarcation membrane module according to claim 4 is the method of dipping a medical fluid after pressure water washes, when especially lock out of a demarcation membrane module is remarkable, it is more effective than the film outside surface of a demarcation membrane module. Moreover, although it can wash of course with a small amount of medical fluid, since this medical fluid can be made to spread uniformly in the whole film surface of a demarcation membrane module, the effect that washing unevenness stops being able to happen easily is also acquired.

[0053] Moreover, in the washing method of a demarcation membrane module according to claim 1 to 4, after the washing method of a demarcation membrane module according to claim 5 dips a medical fluid from the filtrate side of a demarcation membrane module, it discharges the processed liquid in a processed liquid tub, and is the method of dipping a medical fluid from the filtrate side of a demarcation membrane module again. Therefore, when a difference has the lock out state of the film outside surface of a demarcation membrane module by the portion (i.e., when the demarcation membrane side of the demarcation membrane module

is arranged so that it may meet in the depth-sounding direction etc.), it is an effective method, and the cleaning effect of a demarcation membrane module can be heightened further, and washing unevenness cannot happen especially easily.

[0054] Moreover, the washing method of a claim 6 and a demarcation membrane module according to claim 7 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. Namely, divide the processed liquid in a processed liquid tub into multiple times, discharge it, and a medical fluid is dipped from the filtrate side of a demarcation membrane module for this one discharge end of every. [whether all discharge of this processed liquid is performed, and] Or since it is the method of dividing the processed liquid in a processed liquid tub into multiple times, discharging it, and discharging all these processed liquid dipping a medical fluid continuously from the filtrate side of a demarcation membrane module The effect of the washing method of an above-mentioned demarcation membrane module according to claim 5 can be made more reliable, and a still higher effect can be acquired.

[0055] That is, when a difference has the lock out state of a demarcation membrane module by the portion (i.e., when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction etc.), it is an effective method, and the cleaning effect of a demarcation membrane module can be heightened further, and washing unevenness cannot happen especially easily.

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TECHNICAL FIELD

[The technical field to which invention belongs] this invention is immersed in a processed liquid tub, attracts a demarcation membrane module from a filtrate side, filters a processed liquid, and relates to the method of washing the demarcation membrane module blockaded by this filtration.

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PRIOR ART

[Description of the Prior Art] Conventionally, the demarcation membrane module has been used for manufacturing installations, such as sterile water, potable water, and a high purity water, and the purge of air. In addition to these uses, in recent years, using this demarcation membrane module for processing of the high liquid of corruption nature is examined, and the part is put in practical use. Specifically with processing of the high liquid of corruption nature, the secondary treatment and tertiary treatment in sewage treatment, the solid liquid separation in the septic tank, etc. are raised.

[0003] Drawing 2 is the schematic diagram showing an example of a filter which used the demarcation membrane module. Outline composition of the filter of this example is carried out with the processed liquid tub 2, the demarcation membrane module 4 arranged in this processed liquid tub 2, and the pump 6 connected with this demarcation membrane module 4 by the piping 8 for filtrates. By working this pump 6, the processed liquid filled by the processed liquid tub 2 by the inside of the demarcation membrane module 4 becoming negative pressure is filtered by the demarcation membrane module 4, and the filtrate passes along the piping 8 interior for filtrates, and is discharged out of a system.

[0004] The fall of the separability by lock out of the demarcation membrane module 4 which happens by above-mentioned filtration operation can be known by elevation of the differential pressure at the time of the filtration which can be measured with the pressure gage 10 formed in the piping 8 for filtrates, and the fall of a filtration flow rate. Especially, in processing of the high liquid of such corruption nature, lock out of the demarcation membrane module 4 tends to take place, and, for this reason, short period-ization of the life of the demarcation membrane module 4 poses a problem. Then, by moving to the tank for washing which filled the medical fluid, flooding with a fixed time medical fluid and washing the demarcation membrane module 4 blockaded as mentioned above, the lock out causative agent adhering to the demarcation membrane module 4 is removed, and recovering the separability is performed.

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EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, it is the washing method of the demarcation membrane module of this invention according to claim 1. Since it is the method of washing the demarcation membrane module which was immersed in the processed liquid tub, attracted the demarcation membrane module from the filtrate side, filtered the processed liquid, and was blockaded by this filtration, and it is the method of dipping a medical fluid from the filtrate side of a demarcation membrane module after discharging the processed liquid in the processed liquid tub, it is possible for it not to be necessary to move a demarcation membrane module, and to wash with a small amount of medical fluid.

[0051] Moreover, since the washing method of a demarcation membrane module according to claim 2 is the method of dipping a above-mentioned medical fluid two or more times intermittently, it can heighten the cleaning effect further. Moreover, in the washing method of a claim 1 and a demarcation membrane module according to claim 2, since it is in the state where dipped the medical fluid and the medical fluid was filled in this demarcation membrane module from the filtrate side of a demarcation membrane module and is the method of carrying out fixed time maintenance, the washing method of a demarcation membrane module according to claim 3 is the more nearly little amount of medical fluids, and can be washed.

[0052] Moreover, in the washing method of a demarcation membrane module according to claim 1 to 3, after it discharges the processed liquid in a processed liquid tub, since the washing method of a demarcation membrane module according to claim 4 is the method of dipping a medical fluid after pressure water washes, when especially lock out of a demarcation membrane module remarkable, it is more effective than the film outside surface of a demarcation membrane module. Moreover, although it can wash of course with a small amount of medical fluid, since this medical fluid can be made to spread uniformly in the whole film surface of a demarcation membrane module, the effect that washing unevenness stops being able to happen easily is also acquired.

[0053] Moreover, in the washing method of a demarcation membrane module according to claim 1 to 4, after the washing method of a demarcation membrane module according to claim 5 dips a medical fluid from the filtrate side of a demarcation membrane module, it discharges the processed liquid in a processed liquid tub, and is the method of dipping a medical fluid from the filtrate side of a demarcation membrane module again. Therefore, when a difference has the lock out state of the film outside surface of a demarcation membrane module by the portion (i.e., when the demarcation membrane side of the demarcation membrane module is arranged so that it may meet in the depth-sounding direction etc.), it is an effective method, and the cleaning effect of a demarcation membrane module can be heightened further, and washing unevenness cannot happen especially easily.

[0054] Moreover, the washing method of a claim 6 and a demarcation membrane module according to claim 7 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. Namely, the processed liquid in a processed liquid tub is divided into multiple times, and is discharged, and a medical fluid is dipped from the filtrate side of a demarcation membrane module for this one eccentric end of every. Since it is the method of dividing the processed liquid in a processed liquid tub into multiple times, discharging it, and discharging all these processed liquids, performing all eccentric of this processed liquid, or dipping a medical fluid continuously from the filtrate side of a demarcation membrane module, the effect of the washing method of an above-mentioned demarcation membrane module according to claim 5 can be made more reliable, and a still higher effect can be acquired.

[0055] That is, when a difference has the lock out state of a demarcation membrane module by the portion (i.e., when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction etc.), it is an effective method, and the cleaning effect of a demarcation membrane module can be heightened further, and washing unevenness cannot happen especially easily.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the washing method by the medical fluid of the above-mentioned demarcation membrane module 4, you have to move the demarcation membrane module 4 to the tank for washing. Moreover, although performing medical fluid washing of this demarcation membrane module 4 is also considered without moving the demarcation membrane module 4 by discharging the processed liquid in the processed liquid tub 2, changing to this, and filling a medical fluid, to the size of the demarcation membrane module 4, since the capacity of this processed liquid tub 2 is quite big, it needs a lot of medical fluids, and is not practical.

[0006] this invention was made in view of the aforementioned situation, is immersed in a processed liquid tub, attracts a demarcation membrane module from the filtrate side, filters a processed liquid, and does not need movement of a demarcation membrane module in the method of washing the demarcation membrane module blockaded by this filtration, but it is a small amount of medical fluid, and it is efficient and aims at offering the washing method of the demarcation membrane module which washes a demarcation membrane module.

[0007]

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MEANS

[Means for Solving the Problem] The washing method of the demarcation membrane module of this invention is immersed in a processed liquid tub, and attracts a demarcation membrane module from a filtrate side. It was the method of washing the demarcation membrane module which filtered the processed liquid and was blockaded by this filtration, and after discharging the processed liquid in a processed liquid tub, it made to wash a demarcation membrane module into the solution means of the aforementioned technical problem by dipping a medical fluid from the filtrate side of this demarcation membrane module. Moreover, an above-mentioned medical fluid can also be dipped two or more times intermittently. Moreover, in the washing method of an above-mentioned demarcation membrane module, a high cleaning effect can be obtained in the fewer amount of medical fluids by dipping a medical fluid from the filtrate side of a demarcation membrane module, and carrying out fixed time maintenance, where a medical fluid is filled in a demarcation membrane module.

[0008] Moreover, in the washing method of an above-mentioned demarcation membrane module, after discharging the processed liquid in a processed liquid tub and pressure water washes the film outside surface of a demarcation membrane module, a medical fluid can also be dipped from the filtrate side of this demarcation membrane module. Moreover, in the washing method of an above-mentioned demarcation membrane module, after dipping a medical fluid from the filtrate side of a demarcation membrane module, this demarcation membrane module can also be washed by discharging the processed liquid in a processed liquid tub, and dipping a medical fluid from the filtrate side of a demarcation membrane module again.

[0009] Moreover, in the washing method of an above-mentioned demarcation membrane module, in case the processed liquid in a processed liquid tub is discharged, this processed liquid can be divided into multiple times, and can be discharged, and all these processed liquids can also be discharged for this one discharge end of every by the method of dipping a medical fluid from the filtrate side of a demarcation membrane module. Or all these processed liquids can also be discharged by the method of dividing the processed liquid in a processed liquid tub into multiple times, and discharging it, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module. Thus, after discharging the processed liquid in a processed liquid tub, this demarcation membrane module can also be washed by dipping a medical fluid from the filtrate side of a demarcation membrane module again.

[0010]

[Embodiments of the Invention] Drawing 1 shows the example of a suitable filter to enforce the washing method of the demarcation membrane module of this invention. Outline composition of the filter of this example is carried out by the pump 6 connected with the processed liquid tub 2, the demarcation membrane module 4 arranged in this processed liquid tub 2, and this demarcation membrane module 4, and the medical fluid tub 14. The three-way-type change-over valve 12 is formed in the connection of the piping 7 which connects the demarcation membrane module 4, a pump 6, and the medical fluid tub 14, the piping 8 for filtrates, and the piping 16 for medical fluids. By switching this three-way-type change-over valve 12, a switch with the state where piping 7 was connected to the piping 8 for filtrates, and the state where piping 7 was connected to the piping 16 for medical fluids can be performed. Moreover, the opening-and-closing valve 18 is formed in the piping 16 for medical fluids.

[0011] In case it filters, as a state where the three-way-type change-over valve 12 was connected to the piping 8 for filtrates in piping 7, by working a pump 6, the inside of the demarcation membrane module 4 becomes negative pressure, the processed liquid filled by the processed liquid tub 2 is filtered by the demarcation membrane module 4, and the filtrate passes along the piping 8 interior for filtrates from piping 7, and is discharged out of a system.

[0012] The demarcation membrane module 4 blockaded by the above filtration operations is washed as follows. First, based on drawing 1, the example of the washing method of a demarcation membrane module according to claim 1 is explained below. That is, after stopping filtration operation, all the processed liquids filled in the processed liquid tub 2 are discharged. Next, where the opening-and-closing valve 18 is closed, a medical fluid is filled to the medical fluid tub 14. Then, the three-way-type change-over valve 12 is switched in the medical fluid tub 14 direction, and is made into the state where piping 7 and the piping 16 for medical fluids were connected, the opening-and-closing valve 18 is opened, and a medical fluid is dipped. At this time, a medical fluid passes along piping 7 from the piping 16 for medical fluids, oozes out from the inside of the demarcation membrane module 4 to the film outside surface of the demarcation membrane module 4, and is discharged in the processed liquid tub 2. The flow rate of the medical fluid to dip can also be set up by adjusting the open rate of this opening-and-closing valve 18. Moreover, the medical fluid in the medical fluid tub 14 can also be added during the dipping.

[0013] It is necessary to remove the medical fluid adhering to the demarcation membrane module 4 by methods, such as rinsing and dryness, after dipping of this medical fluid. Although this removal method can take arbitrary methods according to the kind of

medical fluid etc., it can change to a medical fluid, can fill water to the medical fluid tub 14, and can also perform this water to it by dipping like dipping of an above-mentioned medical fluid, for example.

[0014] The dipping method of an above-mentioned medical fluid can use a well-known method besides the gravity flow by the above water head differences. For example, the method of sending this medical fluid into the demarcation membrane module 4 with a pump, the method of sending this medical fluid into the demarcation membrane module 4 with the pressure it being stationed in a pressurization container in a medical fluid, and according to a compressor etc., etc. can be used from the medical fluid tub which filled the medical fluid. Moreover, the amount of the minimum dipping of the medical fluid at this time should just be sufficient amount to ooze out to the whole film outside surface of the demarcation membrane module 4. Since it is necessary to dip a medical fluid in fact until this demarcation membrane module 4 can fully wash, the amount of dipping of this medical fluid is a range more than this amount of the minimum dipping, and is arbitrarily set up by a lock out state, its film surface product, etc. of the demarcation membrane module 4. Usually, it is carried out in many cases by 2 to 5 times this amount of the minimum dipping.

[0015] Moreover, arbitrary things can be used for the medical fluid used for washing, and its concentration according to the quality of the material of the demarcation membrane module 4 to wash, the purpose of the filtration, a lock out state, etc. General a sodium hypochlorite, a sodium hydroxide, a hydrochloric acid, a sulfuric acid, oxalic acid, a citric acid, the solution of a surfactant, alcohol, etc. can be used.

[0016] Thus, since it is the method of dipping a medical fluid from the filtrate side of the demarcation membrane module 4 after discharging the processed liquid in the processed liquid tub 2, it is not necessary to move the demarcation membrane module 4 out of the processed liquid tub 2 and, and a small amount of medical fluid can wash. Moreover, beforehand, in order to discharge the processed liquid in the processed liquid tub 2, the medical fluid which oozed out from the filtrate side of the demarcation membrane module 4 to the film outside surface is not diluted by the processed liquid by dipping a medical fluid. For this reason, sufficient cleaning effect can be pulled out, without reducing the washing capacity of a medical fluid.

[0017] Moreover, in case a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, a pressure is applied from the filtrate side of the demarcation membrane module 4, and the force which pulls apart the lock out causative agent which stuck to the film outside surface from a film outside surface works. For this reason, in a cleaning effect, it is more advantageous. The force which pulls apart the lock out causative agent which stuck to the film outside surface of the demarcation membrane module 4 from this film outside surface becomes large, so that this pressure is larger than the filtrate side of the above-mentioned demarcation membrane module 4. However, if this pressure is too large, since the demarcation membrane module 4 may be torn or the intensity may fall, it usually considers as 1-4m water head. This pressure can be adjusted with the flow rate of medical fluid etc. An above-mentioned pressure changes with the configuration of the demarcation membrane module 4, a fractionation performance, and its lock out states. In case what has a small fractionation performance, and what has severe lock out dip a medical fluid, a bigger pressure than the filtrate side of the demarcation membrane module 4 has this inclination.

[0018] In the example of the washing method of an above-mentioned demarcation membrane module, the thing of arbitrary configurations, such as a flat film type [which does not limit and consists of the arbitrary quality of the materials, such as a cellulose, a polyolefine, a polysulfone, a polyvinylidene fluoride, polytetrafluoroethylene, and a ceramic], hollow fiber type, tubular type, an saccate type, can be used especially for the configuration and the quality of the material of the demarcation membrane module 4 which can be washed. Moreover, although the fractionation performance of this demarcation membrane module 4 can choose arbitrary things for the purpose of the filtration, within the limits of an above-mentioned pressure, it is desirable that a medical fluid can be dipped from the filtrate side of the demarcation membrane module 4, and a 0.01-1-micrometer thing can usually be used for it.

[0019] With configurations of this demarcation membrane module 4, how depending on which the medical fluid from the film outside surface oozes, the pressure which can be put from the filtrate side change in the case of washing. For example, since a medical fluid oozes from the whole film outside surface to homogeneity when the flat film type demarcation membrane module 4 is used, washing unevenness cannot happen easily. However, the pressure which can be put from the filtrate side of the demarcation membrane module 4 becomes small as compared with the case where a hollow fiber type is used. Moreover, when a hollow fiber type is used for the demarcation membrane module 4, since the pressure which can be put from the filtrate side of the demarcation membrane module 4 can be enlarged as compared with a flat film type, it can heighten this cleaning effect more. However, since some pressure distribution exist in the longitudinal direction of this hollow fiber, there is an inclination for washing unevenness to tend [a little] to happen. In consideration of the difference of the cleaning effect by the configuration of such a demarcation membrane module 4, it is necessary to set up conditions, such as a kind of medical fluid, concentration and its flow rate, and the amount of dipping.

[0020] Moreover, the washing method of a demarcation membrane module according to claim 2 is the method of dipping a medical fluid two or more times intermittently in the example of the washing method of an above-mentioned demarcation membrane module according to claim 1. It is in the state where piping 7 and the piping 16 for medical fluids were connected, the operation opens the opening-and-closing valve 18, and when it dips some medical fluids filled by the medical fluid tub 14, it closes the opening-and-closing valve 18. Then, the opening-and-closing valve 18 is opened again, and it is carried out by repeating dipping some medical fluids again filled by the medical fluid tub 14 two or more times.

[0021] In this case, the amount of the medical fluid dipped in the 1st time can be arbitrarily set up by the film surface product of the demarcation membrane module 4 etc. that what is necessary is just more mostly than the amount of the minimum dipping, i.e., sufficient amount to ooze out to the whole film outside surface of the demarcation membrane module 4. Although 2nd henceforth : better than this amount of the minimum dipping at least, it is usually set up in the 2 to 5 times as much range as this amount of the

minimum dipping. Moreover, although the number of times which dips a medical fluid can be set up arbitrarily, it is usually made into 3 - 6 times. It is necessary to set up these conditions suitably according to the lock out state etc. so that washing of the demarcation membrane module 4 may easily be performed. Since according to this method the extraction efficiency of a medical fluid to the lock out causative agent of the demarcation membrane module 4 goes up rather than it dips a medical fluid continuously, it is desirable. Moreover, in case a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, since the force which pulls apart the lock out causative agent by this pressure which stuck to the film outside surface from the film outside surface from the filtrate side of the demarcation membrane module 4 is added over multiple times, it is more effective [0022] Moreover, in the washing method of a demarcation membrane module according to claim 1, since the washing method of demarcation membrane module according to claim 3 is a method which heightened the cleaning effect further by dipping a medical fluid from the filtrate side of the demarcation membrane module 4, being in the state where the medical fluid was filled in the demarcation membrane module 4, and carrying out fixed time maintenance, it is the fewer amount of medical fluids, and can wash this demarcation membrane module 4.

[0023] That is, in the example of the washing method of an above-mentioned demarcation membrane module according to claim 1, the medical fluid filled by the medical fluid tub 14 is dipped until a medical fluid oozes to the whole film outside surface of the demarcation membrane module 4. It can hold, where a medical fluid is filled with the state where the medical fluid remains in the medical fluid tub 14 or the piping 16 for medical fluids which connects the opening-and-closing valve 18 with the medical fluid tub 14 at this time, in the demarcation membrane module 4, when this opening-and-closing valve 18 was closed. This holding time can be arbitrarily set up, if it is 5 minutes - 48 hours. If there is no difference with the case where a medical fluid is continuously dipped as it is less than 5 minutes and 48 hours is exceeded, the medical fluid which oozed out to the film outside surface of the demarcation membrane module 4 may dry, and it is not desirable. After this holding time, the opening-and-closing valve 18 is opened again, and a medical fluid is discharged out of the demarcation membrane module 4. Then, the medical fluid adhering to the demarcation membrane module 4 is removed.

[0024] Moreover, the washing method of this demarcation membrane module according to claim 3 is also applicable to the washing method of a demarcation membrane module according to claim 2. That is, in the example of the washing method of an above-mentioned demarcation membrane module according to claim 2, when some medical fluids filled by the medical fluid tub 1 are dipped, the opening-and-closing valve 18 is closed, and where a medical fluid is filled in the demarcation membrane module 4, it holds. It is also repeatable to open the opening-and-closing valve 18, and to hold again, next, where it closed this opening-and-closing valve 18 and a medical fluid is filled in the demarcation membrane module 4, when some medical fluids filled by the medical fluid tub 14 are made to dip. After the holding time of the last medical fluid is completed, like the case where it is a ****, a medical fluid is discharged from the demarcation membrane module 4, and the medical fluid adhering to this demarcation membrane module 4 is removed.

[0025] At this time, like an above-mentioned case, if the holding time of the medical fluid performed two or more times is 5 minutes - 48 hours, it can be set as arbitration, respectively. Dipping and the number of times of maintenance of this medical fluid are usually carried out all the time 3 to 6 times, although it can set up suitably so that the dirt of this demarcation membrane module 4 can fully wash.

[0026] In the example of the washing method of an above-mentioned demarcation membrane module according to claim 1 to 3, the washing method of a demarcation membrane module according to claim 4 is an effective method, when especially lock out of the demarcation membrane module 4 is remarkable. That is, after discharging the processed liquid in the processed liquid tub 2, and the pressure water of 200-1000kPa washes from the film outside surface of the demarcation membrane module 4, a medical fluid is dipped from the filtrate side of this demarcation membrane module 4. The flow rate and washing time of this pressure water can be arbitrarily set up according to a film surface product, its lock out state, etc. of the demarcation membrane module 4. Thus although it can wash of course with a small amount of medical fluid by washing the film outside surface of the demarcation membrane module 4 with pressure water beforehand before dipping a medical fluid, since a medical fluid can be made to spread uniformly in the whole film surface of the demarcation membrane module 4, the effect that washing unevenness stops being able to happen easily is also acquired.

[0027] In the example of the washing method of an above-mentioned demarcation membrane module according to claim 1 to 4, the washing method of a demarcation membrane module according to claim 5 is the method of discharging the processed liquid in the processed liquid tub 2, and dipping a medical fluid from the filtrate side of the demarcation membrane module 4 again, after dipping a medical fluid from the filtrate side of this demarcation membrane module 4.

[0028] At this time, dipping of a medical fluid performed before discharging the processed liquid in the processed liquid tub 2 can be performed like an above-mentioned case. There should be just more these amounts of dipping than the amount of the minimum dipping, i.e., sufficient amount for this medical fluid to ooze to the whole film outside surface of the demarcation membrane module 4. Usually, it is set up by 2 to 5 times this amount of the minimum dipping. Moreover, usually, if the flow rate at this time is a grad which does not affect the intensity of the demarcation membrane module 4, although it can be set up arbitrarily, it is adjusted from the filtrate side of this demarcation membrane module 4 so that this pressure may be 1-4m water head.

[0029] Thus, beforehand, where a processed liquid is filled in the processed liquid tub 2, by dipping a medical fluid from the filtrate side of the demarcation membrane module 4, a pressure will be applied to the filtrate side of the demarcation membrane module 4, and a medical fluid will permeate. For this reason, in washing performed after discharging the processed liquid in the processed liquid tub 2, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 comes to ooze from the whole filtrate side of the demarcation membrane module 4 to homogeneity.

[0030] This method is a method effective when the lock out state of the demarcation membrane module 4 has a difference by the portion, and when being especially arranged so that the demarcation membrane side of the demarcation membrane module 4 may meet in the depth-sounding direction, it is the washing method that the effect is large. That is, the solid-state which is the lock out causative agent of the demarcation membrane module 4 contained in the processed liquid in the processed liquid tub 2 tends to exist into the lower part portion in the processed liquid tub 2 mostly. For this reason, surely, this solid-state tends to adhere more mostly, namely, it becomes easy to blockade, when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, so that it is the lower part portion of this demarcation membrane module 4.

[0031] Thus, this pressure becomes relatively and large from the filtrate side of the demarcation membrane module 4, so that it is the lower part portion of the demarcation membrane module 4 by the water head difference of this medical fluid to dip, when a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, where a processed liquid is filled in the processed liquid tub 2 as mentioned above, when being arranged so that the demarcation membrane side of the demarcation membrane module 4 may meet in the depth-sounding direction. That is, the pressure from the filtrate side of the demarcation membrane module 4 with a bigger lower part portion with more remarkable lock out becomes this thing. For this reason, in washing performed after discharging a processed liquid, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 comes to ooze from the whole filtrate side of the demarcation membrane module 4 to homogeneity. Therefore, the cleaning effect of the demarcation membrane module 4 can be heightened further, and washing unevenness cannot happen easily, either.

[0032] The washing method of a claim 6 and a demarcation membrane module according to claim 7 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. The washing method of these demarcation membrane modules is a method for making the effect of the washing method of an above-mentioned demarcation membrane module according to claim 5 more certain still higher.

[0033] The discharge method of the processed liquid in the processed liquid tub 2 in the washing method of a demarcation membrane module according to claim 6 is explained below. That is, in the example of the washing method of a demarcation membrane module according to claim 1 to 4, a part of processed liquid filled by the processed liquid tub 2 is discharged. Next, a medical fluid is dipped from the filtrate side of the demarcation membrane module 4. Discharge of this processed liquid and dipping of a medical fluid are repeated two or more times, and all processed liquids are discharged.

[0034] The dipping method of the medical fluid at this time and its flow rate are the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 5. There should be just more amounts of dipping of the medical fluid of these multiple times than sufficient amount for this medical fluid to ooze from the film outside surface of the portion immersed in the processed liquid among the demarcation membrane modules 4, respectively. Although the number of times which discharges a processed liquid can be arbitrarily set up with the size of the demarcation membrane module 4 etc., it is usually made into 3 - 6 times.

[0035] When the demarcation membrane module 4 is immersed in the processed liquid, the water pressure of this processed liquid is poured to the film outside surface of the immersed portion. Therefore, if a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, the pressure from the filtrate side of this demarcation membrane module 4 with the bigger portion immersed in the processed liquid will become this thing from the portion which has not been immersed in a processed liquid among this demarcation membrane module 4. A big pressure becomes this thing from the filtrate side relatively, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, since this processed liquid is discharged gradually.

[0036] That is, the bigger pressure of this number of times increases from the filtrate side of this demarcation membrane module 4 so that it is the portion which it tends to blockade when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction. Therefore, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 can be made to ooze out from the whole film surface of the demarcation membrane module 4 to homogeneity more regardless of the difference of the lock out state at the time of the filtration operation in washing performed after discharging the processed liquid in this processed liquid tub 2. For this reason, in above-mentioned washing, washing unevenness cannot happen easily and the cleaning effect can be heightened further.

[0037] Moreover, in the washing method of a demarcation membrane module according to claim 7, a different place from the washing method of a demarcation membrane module according to claim 6 is a point which divides the processed liquid in a processed liquid tub into multiple times, discharges it, and discharges all these processed liquids, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module.

[0038] That is, in the example of the washing method of a demarcation membrane module according to claim 1 to 4, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module, the processed liquid filled by the processed liquid tub 2 is divided into multiple times, it discharges gradually, and all these processed liquids are discharged. The amount of dipping of the medical fluid at this time should just be an amount which can be dipped continuously, while having discharged the processed liquid. Moreover, the flow rate at this time is the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 5. Although the number of times which discharges a processed liquid can be arbitrarily set up with the amount of processed liquids, the size of the demarcation membrane module 4, etc., it is usually made into 3 - 6 times.

[0039] In this case, since a medical fluid is dipped continuously, a pressure becomes this thing from the filtrate side of the demarcation membrane module 4 continuously. Moreover, a pressure with the bigger portion immersed in the processed liquid among this demarcation membrane module 4 than the portion which has not been immersed in a processed liquid becomes this thing from the filtrate side. Long time and a bigger pressure become this thing, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction, since this processed liquid is discharged gradually. [0040] By the way, there is an inclination which is easy to blockade, so that it is the lower part portion of the depth-sounding direction of this demarcation membrane side, when the demarcation membrane side of the demarcation membrane module 4 is arranged as mentioned above so that it may meet in the depth-sounding direction. That is, this time becomes [an above more big pressure] long, so that it is the portion which is easy to blockade. Therefore, the medical fluid dipped from the filtrate side of the demarcation membrane module 4 can be made to ooze out from the whole film surface of the demarcation membrane module 4 to homogeneity regardless of the difference of the lock out state at the time of the filtration operation in washing performed after discharging the processed liquid in this processed liquid tub 2. For this reason, washing unevenness cannot happen easily and the cleaning effect can be heightened further.

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EXAMPLE

[Example] Hereafter, an example is shown and this invention is explained in detail.

(Example 1) The washing examination of a demarcation membrane module was performed using the filter of structure as shown in drawing 1. The demarcation membrane module 4 arranges in parallel five Mitsubishi Rayon Co., Ltd. make "the STELLA pore L" (the fractionation performance of 0.1 micrometers, hollow fiber use), and installs it (since this film surface product of one sheet is 2 2m, the film surface product at the time of using these five sheets is 2 10m). The diaphragm pump (tradename) was used for the pump 6.

[0042] As a processed liquid, the water which made 200 ppm yeast suspend was used. Filtration operation of an above-mentioned filter was performed by filtration flow rate 660 ml/min. Consequently, the differential pressure at the time of the filtration at the time of an experiment start is 23cmHg(s), and the differential pressure after 2-hour operation was set to 60cmHg(s).

[0043] Thus, washing by the medical fluid was performed about the blockaded demarcation membrane module 4. That is, all the processed liquids filled in the processed liquid tub 2 were discharged first. The sodium-hydroxide solution was dipped 1 5l.%, next, as a medical fluid, just before the whole of this medical fluid flows and fell, the opening-and-closing valve 18 was closed, and it considered as the state where the medical fluid was filled in the demarcation membrane module 4. At this time, the water head difference at the time of dipping this medical fluid was 3m, and the flow rate of this medical fluid was 400 ml/min. As it is, after holding for 3 hours, the medical fluid in the demarcation membrane module 4 was discharged, and this demarcation membrane module 4 was fully rinsed.

[0044] Thus, about the washed demarcation membrane module 4, again, using the water which made 200 ppm yeast suspend as processed liquid, the filtration flow rate was fixed 660 ml/min, and performed filtration operation. Consequently, the differential pressure at the time of early filtration was 22cmHg(s).

[0045] (Example 2) In an example 2, a different place from an example 1 is a point which dips a medical fluid two or more times intermittently. That is, the demarcation membrane module 4 blockaded like the example 1 was washed as follows. First, all the processed liquids filled in the processed liquid tub 2 were discharged. Next, the sodium-hydroxide solution was dipped as a medical fluid 1 5l.%, just before the whole of this medical fluid flows and fell, the opening-and-closing valve 18 was closed, and it considered as the state where the medical fluid was filled in the demarcation membrane module 4, and this state was held for 3 hours. Next, the sodium-hydroxide solution was dipped like the above-mentioned case 1 3 morel.%, it considered as the state where the medical fluid was filled in the demarcation membrane module 4, and this state was held for 2 hours. Like the 2nd time, after repeating dipping and its maintenance of a medical fluid twice, the medical fluid in the demarcation membrane module 4 was discharged, and this demarcation membrane module 4 was fully rinsed. 1% sodium-hydroxide solution used at this time was 14l. in all.

[0046] Thus, as a processed liquid, using the water which made 200 ppm yeast suspend, the filtration flow rate was fixed 660 ml/min, and performed filtration operation again about the washed demarcation membrane module 4. Consequently, the differential pressure at the time of early filtration was 22cmHg(s).

[0047] (Example of comparison) About the demarcation membrane module 4 blockaded like the example 1, it washed as follows. Namely, this demarcation membrane module 4 was removed from the inside of the processed liquid tub 2, and it flooded with the tank for washing which filled the sodium-hydroxide solution 1 100l.% for 3 hours. Then, the demarcation membrane module 4 was fully rinsed.

[0048] Thus, the washed demarcation membrane module 4 was again installed in the processed liquid tub 2, and filtration operation was performed by filtration flow rate 660 ml/min using the water which made 200 ppm yeast suspend as a processed liquid. Consequently, the differential pressure at the time of early filtration was 23cmHg(s).

[0049] Thus, in the example 1 and example 2 concerning the washing method of the demarcation membrane module of this invention, it is in Ming that a cleaning effect without the example of comparison which it is not necessary to move the demarcation membrane module 4 and, is a small amount of medical fluid, and is the washing method of the conventional demarcation membrane module, and inferiority is obtained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the schematic diagram showing the example of a suitable filter to enforce the washing method of the demarcation membrane module of this invention.

[Drawing 2] It is the schematic diagram showing the example of the filter using the demarcation membrane module.

[Description of Notations]

2 [... Medical fluid tub] ... A processed liquid tub, 4 ... A demarcation membrane module, 14

[Translation done.]

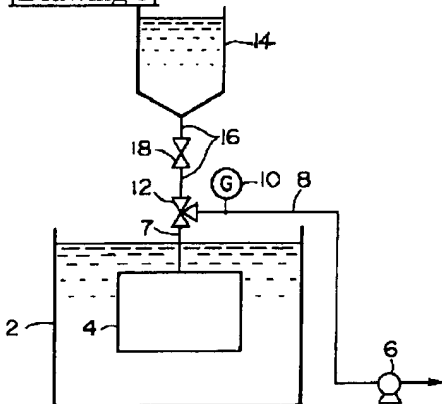
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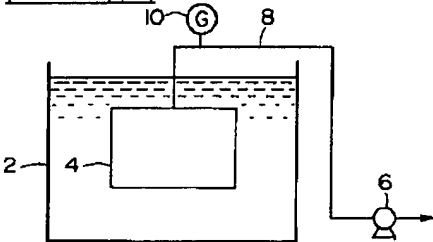
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DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]

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CORRECTION or AMENDMENT

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K .

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[Filing Date] September 13, Heisei 14 (2002. 9.13)

[Procedure amendment 1]

[Document to be Amended] Specification.

[Item(s) to be Amended] Claim.

[Method of Amendment] Change.

[Proposed Amendment]

[Claim(s)]

[Claim 1] The washing method of the demarcation membrane module which is the method of washing the demarcation membrane module which was immersed in the processed liquid tub, attracted the demarcation membrane module from the filtrate side, filter the processed liquid, and was blockaded by this filtration, and is characterized by washing a demarcation membrane module by carrying out multiple-times dipping of the medical fluid intermittently from the filtrate side of a demarcation membrane module after discharging the processed liquid in a processed liquid tub.

[Claim 2] It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. It is the method of washing the demarcation membrane module blockaded by this filtration. The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of a demarcation membrane module, and carrying out fixed time maintenance where a medical fluid is filled in this demarcation membrane module after discharging the processed liquid in a processed liquid tub.

[Claim 3] It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. It is the method of washing the demarcation membrane module blockaded by this filtration. The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module after discharging the processed liquid in a processed liquid tub and pressur water washes from the film outside surface of a demarcation membrane module.

[Claim 4] It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. By being the method of washing the demarcation membrane module blockaded by this filtration, discharging the processed liquid in a processed liquid tub, after dipping a medical fluid from the filtrate side of a demarcation membrane module, and dipping a medical fluid from the filtrate side of this demarcation membrane module again The washing method of the demarcation membrane module characterized by washing a demarcation membrane module.

[Claim 5] It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. Are the method of washing the demarcation membrane module blocked by this filtration, divide the processed liquid in a processed liquid tub into multiple times, discharge it, and for this one end of every by the method of dipping a medical fluid from the filtrate side of a demarcation membrane module The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module again after discharging the whole of this processed liquid.

[Claim 6] Being the method of washing the demarcation membrane module which was immersed in the processed liquid tub, attracted the demarcation membrane module from the filtrate side, filtered the processed liquid, and was blocked by this filtration, and dipping a medical fluid continuously from the filtrate side of a demarcation membrane module The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of this demarcation membrane module again by the method of dividing into multiple times and discharging the processed liquid in a processed liquid tub after discharging the whole of this processed liquid.

[Claim 7] The washing method of the demarcation membrane module characterized by washing a demarcation membrane module by dipping a medical fluid from the filtrate side of the demarcation membrane module whose fractionation performance it is the method of washing the demarcation membrane module which was immersed in the processed liquid tub, attracted the demarcation membrane module from the filtrate side, filtered the processed liquid, and was blocked by this filtration, and is 0.01-1 micrometer after discharging the processed liquid in a processed liquid tub.

[Procedure amendment 2]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0007.

[Method of Amendment] Change.

[Proposed Amendment]

[0007]

[Means for Solving the Problem] The washing method of the demarcation membrane module of this invention is immersed in a processed liquid tub, and attracts a demarcation membrane module from a filtrate side. By filtering a processed liquid, and carrying out multiple-times dipping of the medical fluid intermittently from the filtrate side of this demarcation membrane module, after being the method of washing the demarcation membrane module blocked by this filtration and discharging the processed liquid in a processed liquid tub It made to wash a demarcation membrane module into the solution means of the aforementioned technical problem. Moreover, as the washing method of other demarcation membrane modules, after discharging the processed liquid in a processed liquid tub, a high cleaning effect can be obtained in the fewer amount of medical fluids by dipping a medical fluid from the filtrate side of a demarcation membrane module, and carrying out fixed time maintenance, where a medical fluid is filled in a demarcation membrane module.

[Procedure amendment 3]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0008.

[Method of Amendment] Change.

[Proposed Amendment]

[0008] Moreover, after discharging the processed liquid in a processed liquid tub and pressure water washes the film outside surface of a demarcation membrane module as the washing method of other demarcation membrane modules, a medical fluid can also be dipped from the filtrate side of this demarcation membrane module. Moreover, as the washing method of other demarcation membrane modules, after dipping a medical fluid from the filtrate side of a demarcation membrane module, this demarcation membrane module can also be washed by discharging the processed liquid in a processed liquid tub, and dipping a medical fluid from the filtrate side of a demarcation membrane module again.

[Procedure amendment 4]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0009.

[Method of Amendment] Change.

[Proposed Amendment]

[0009] Moreover, as the washing method of other demarcation membrane modules, in case the processed liquid in a processed liquid tub is discharged, this processed liquid can be divided into multiple times, and can be discharged, and all these processed liquids can also be discharged for this one discharge end of every by the method of dipping a medical fluid from the filtrate side of a demarcation membrane module. Or all these processed liquids can also be discharged by the method of dividing the processed liquid in a processed liquid tub into multiple times, and discharging it, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module. Thus, after discharging the processed liquid in a processed liquid tub, this demarcation membrane module can also be washed by dipping a medical fluid from the filtrate side of a demarcation membrane module again.

Furthermore, as the washing method of other demarcation membrane modules, after discharging the processed liquid in a processed liquid tub, this demarcation membrane module can also be washed by dipping a medical fluid from the filtrate side of the demarcation membrane module whose fractionation performance is 0.01-1 micrometer.

[Procedure amendment 5]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0012.

[Method of Amendment] Change.

[Proposed Amendment]

[0012] The demarcation membrane module 4 blocked by the above filtration operations is washed as follows. First, based on drawing 1, the example of the washing method of a demarcation membrane module according to claim 1 is explained below. That is, after stopping filtration operation, all the processed liquids filled in the processed liquid tub 2 are discharged. Next, where the opening-and-closing valve 18 is closed, a medical fluid is filled to the medical fluid tub 14. Then, the three-way-type change-over valve 12 is switched in the medical fluid tub 14 direction, and is made into the state where piping 7 and the piping 16 for medical fluids were connected, the opening-and-closing valve 18 is opened, and a medical fluid is dipped. At this time, a medical fluid passes along piping 7 from the piping 16 for medical fluids, oozes out from the inside of the demarcation membrane module 4 to the film outside surface of the demarcation membrane module 4, and is discharged in the processed liquid tub 2. The flow rate of the medical fluid to dip can also be set up by adjusting the open rate of this opening-and-closing valve 18. Moreover, the medical fluid in the medical fluid tub 14 can also be added during the dipping. And a medical fluid is dipped two or more times intermittently here. It is in the state where piping 7 and the piping 16 for medical fluids were connected, the operation opens the opening-and-closing valve 18, and when it dips some medical fluids filled by the medical fluid tub 14, it closes the opening-and-closing valve 18. Then, the opening-and-closing valve 18 is opened again, and it is carried out by repeating dipping some medical fluids again filled by the medical fluid tub 14 two or more times. In this case, the amount of the medical fluid dipped in the 1st time can be arbitrarily set up by the film surface product of the demarcation membrane module 4 etc. that what is necessary is just more than the amount of the minimum dipping, i.e., sufficient amount to ooze out to the whole film outside surface of the demarcation membrane module 4. Although 2nd henceforth is better than this amount of the minimum dipping at least, it is usually set up in the 2 to 5 times as much range as this amount of the minimum dipping. Moreover, although the number of times which dips a medical fluid can be set up arbitrarily, it is usually made into 3 - 6 times. It is necessary to set up these conditions suitably according to the lock out state etc. so that washing of the demarcation membrane module 4 may fully be performed. Since according to this method the extraction efficiency of a medical fluid to the lock out causative agent of the demarcation membrane module 4 goes up rather than it dips a medical fluid continuously, it is desirable. Moreover, in case a medical fluid is dipped from the filtrate side of the demarcation membrane module 4, since the force which pulls apart the lock out causative agent by this pressure which stuck to the film outside surface from the film outside surface from the filtrate side of the demarcation membrane module 4 is added over multiple times, it is more effective.

[Procedure amendment 6]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0020.

[Method of Amendment] Deletion.

[Procedure amendment 7]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0021.

[Method of Amendment] Deletion.

[Procedure amendment 8]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0022.

[Method of Amendment] Change.

[Proposed Amendment]

[0022] Moreover, since the washing method of a demarcation membrane module according to claim 2 is a method which heightened the cleaning effect further by dipping a medical fluid from the filtrate side of the demarcation membrane module 4, being in the state where the medical fluid was filled in the demarcation membrane module 4, and carrying out fixed time maintenance after discharging the processed liquid in a processed liquid tub, it is the fewer amount of medical fluids, and can wash this demarcation membrane module 4. In this case, it is not necessary to necessarily dip a medical fluid two or more times intermittently.

[Procedure amendment 9]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0023.

[Method of Amendment] Change.

[Proposed Amendment]

[0023] That is, in not dipping a medical fluid two or more times intermittently, it dips the medical fluid filled by the medical fluid tub 14 until a medical fluid oozes to the whole film outside surface of the demarcation membrane module 4. It can hold, where a medical fluid is filled with the state where the medical fluid remains in the medical fluid tub 14 or the piping 16 for medical fluids which connects the opening-and-closing valve 18 with the medical fluid tub 14 at this time, in the demarcation membrane module 4, when this opening-and-closing valve 18 was closed. This holding time can be arbitrarily set up, if it is 5 minutes - 48 hours. If there is no difference with the case where a medical fluid is continuously dipped as it is less than 5 minutes and 48 hours is exceeded, the medical fluid which oozed out to the film outside surface of the demarcation membrane module 4 may dry, and it is not desirable. After this holding time, the opening-and-closing valve 18 is opened again, and a medical fluid is discharged out of

the demarcation membrane module 4. Then, the medical fluid adhering to the demarcation membrane module 4 is removed.

[Procedure amendment 10]

[Document to be Amended] Specifica

[Item(s) to be Amended] 0024.

[Method of Amendment] Change.

[Proposed Amendment]

[0024] When a medical fluid is dipped two or more times intermittently and some medical fluids filled by the medical fluid tub 14 are dipped, the opening-and-closing valve 18 is closed, and where a medical fluid is filled in the demarcation membrane module 4 it holds. It is also repeatable to open the opening-and-closing valve 18, and to hold again, next, where it closed this opening-and-closing valve 18 and a medical fluid is filled in the demarcation membrane module 4, when some medical fluids filled by the medical fluid tub 14 are made to dip. After the holding time of the last medical fluid is completed, like the case where it is a ****, a medical fluid is discharged from the demarcation membrane module 4, and the medical fluid adhering to this demarcation membrane module 4 is removed.

[Procedure amendment 11]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0026.

[Method of Amendment] Change.

[Proposed Amendment]

[0026] The washing method of a demarcation membrane module according to claim 3 is a method effective when especially lock out of the demarcation membrane module 4 is remarkable. That is, after discharging the processed liquid in the processed liquid tub 2, and the pressure water of 200-1000kPa washes from the film outside surface of the demarcation membrane module 4, a medical fluid is dipped from the filtrate side of this demarcation membrane module 4. The flow rate and washing time of this pressure water can be arbitrarily set up according to a film surface product, its lock out state, etc. of the demarcation membrane module 4. Thus, although it can wash of course with a small amount of medical fluid by washing the film outside surface of the demarcation membrane module 4 with pressure water beforehand before dipping a medical fluid, since a medical fluid can be made to spread uniformly in the whole film surface of the demarcation membrane module 4, the effect that washing unevenness stops being able to happen easily is also acquired.

[Procedure amendment 12]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0027.

[Method of Amendment] Change.

[Proposed Amendment]

[0027] The washing method of a demarcation membrane module according to claim 4 is the method of discharging the processed liquid in the processed liquid tub 2, and dipping a medical fluid from the filtrate side of the demarcation membrane module 4 again after dipping a medical fluid from the filtrate side of this demarcation membrane module 4.

[Procedure amendment 13]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0032.

[Method of Amendment] Change.

[Proposed Amendment]

[0032] The washing method of a claim 5 and a demarcation membrane module according to claim 6 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. The washing method of these demarcation membrane modules is a method for making the effect of the washing method of an above-mentioned demarcation membrane module according to claim 4 more certain still higher.

[Procedure amendment 14]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0033.

[Method of Amendment] Change.

[Proposed Amendment]

[0033] The eccrisis method of the processed liquid in the processed liquid tub 2 in the washing method of a demarcation membrane module according to claim 5 is explained below. That is, a part of processed liquid filled by the processed liquid tub 2 is discharged. Next, a medical fluid is dipped from the filtrate side of the demarcation membrane module 4. Eccrisis of this processed liquid and dipping of a medical fluid are repeated two or more times, and all processed liquids are discharged.

[Procedure amendment 15]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0034.

[Method of Amendment] Change.

[Proposed Amendment]

[0034] The dipping method of the medical fluid at this time and its flow rate are the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 4. There should be just more amounts of

dipping of the medical fluid of these multiple times than sufficient amount for this medical fluid to ooze from the film outside surface of the portion immersed in the processed liquid among the demarcation membrane modules 4, respectively. Although the number of times which discharges a processed liquid can be arbitrarily set up with the size of the demarcation membrane module 4 etc., it is usually made into 3 - 6 times.

[Procedure amendment 16]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0037.

[Method of Amendment] Change.

[Proposed Amendment]

[0037] Moreover, in the washing method of a demarcation membrane module according to claim 6, a different place from the washing method of a demarcation membrane module according to claim 5 is a point which divides the processed liquid in a processed liquid tub into multiple times, discharges it, and discharges all these processed liquids, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module.

[Procedure amendment 17]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0038.

[Method of Amendment] Change.

[Proposed Amendment]

[0038] That is, dipping a medical fluid continuously from the filtrate side of a demarcation membrane module, the processed liquid filled by the processed liquid tub 2 is divided into multiple times, it discharges gradually, and all these processed liquids are discharged. The amount of dipping of the medical fluid at this time should just be an amount which can be dipped continuously, while having discharged the processed liquid. Moreover, the flow rate at this time is the same as that of the example of the washing method of an above-mentioned demarcation membrane module according to claim 4. Although the number of times which discharges a processed liquid can be arbitrarily set up with the amount of processed liquids, the size of the demarcation membrane module 4, etc., it is usually made into 3 - 6 times.

[Procedure amendment 18]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0050.

[Method of Amendment] Change.

[Proposed Amendment]

[0050]

[Effect of the Invention] As explained above, the washing method of the demarcation membrane module of this invention according to claim 1 It is immersed in a processed liquid tub, attract a demarcation membrane module from a filtrate side, and a processed liquid is filtered. Since it is the method of washing the demarcation membrane module blockaded by this filtration, and is the method of carrying out multiple-times dipping of the medical fluid intermittently from the filtrate side of a demarcation membrane module after discharging the processed liquid in the processed liquid tub It is possible for it not to be necessary to move a demarcation membrane module, and to wash with a small amount of medical fluid.

[Procedure amendment 19]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0051.

[Method of Amendment] Change.

[Proposed Amendment]

[0051] Moreover, since it is in the state where dipped the medical fluid and the medical fluid was filled in this demarcation membrane module from the filtrate side of a demarcation membrane module and is the method of carrying out fixed time maintenance, the washing method of a demarcation membrane module according to claim 2 is the more nearly little amount of medical fluids, and can be washed.

[Procedure amendment 20]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0052.

[Method of Amendment] Change.

[Proposed Amendment]

[0052] Moreover, after it discharges the processed liquid in a processed liquid tub, since the washing method of a demarcation membrane module according to claim 3 is the method of dipping a medical fluid after pressure water washes, when especially local out of a demarcation membrane module is remarkable, it is more effective than the film outside surface of a demarcation membrane module. Moreover, although it can wash of course with a small amount of medical fluid, since this medical fluid can be made to spread uniformly in the whole film surface of a demarcation membrane module, the effect that washing unevenness stops being able to happen easily is also acquired.

[Procedure amendment 21]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0053.

[Method of Amendment] Change.

[Proposed Amendment]

[0053] Moreover, after the washing method of a demarcation membrane module according to claim 4 dips a medical fluid from the filtrate side of a demarcation membrane module, it discharges the processed liquid in a processed liquid tub, and is the method of dipping a medical fluid from the filtrate side of a demarcation membrane module again. Therefore, when a difference has the lock out state of the film outside surface of a demarcation membrane module by the portion (i.e., when the demarcation membrane side of the demarcation membrane module 4 is arranged so that it may meet in the depth-sounding direction etc.), it is an effective method, and the cleaning effect of a demarcation membrane module can be heightened further, and washing unevenness cannot happen especially easily.

[Procedure amendment 22]

[Document to be Amended] Specification.

[Item(s) to be Amended] 0054.

[Method of Amendment] Change.

[Proposed Amendment]

[0054] Moreover, the washing method of a claim 5 and a demarcation membrane module according to claim 6 has the feature in the method of discharging the processed liquid in the processed liquid tub 2. Namely, divide the processed liquid in a processed liquid tub into multiple times, discharge it, and a medical fluid is dipped from the filtrate side of a demarcation membrane module for this one eccrisis end of every. [whether all eccrisis of this processed liquid is performed, and] Or since it is the method of dividing the processed liquid in a processed liquid tub into multiple times, discharging it, and discharging all these processed liquid dipping a medical fluid continuously from the filtrate side of a demarcation membrane module The effect of the washing method of an above-mentioned demarcation membrane module according to claim 4 can be made more reliable, and a still higher effect can be acquired.

[Translation done.]